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AUTHOR	Singer, Harry
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ABSTRACT

Integration in Riverside Unified School District, California, justified on moral, legal, social, and educational grounds, provided a natural time-series experiment for testing the unexpected effects of lateral transmission of peer group values and normalization of instruction on the achievement of Anglos (81.5 percent), blacks (6.1 percent), and Mexican-Americans (10.7 percent). After 1-3 years integration for the various groups, results were analyzed by comparison of 1966-68 post-integration data with 1966 pre-integration cross-sectional data for primary and intermediate grades. Interpretation of these analyses supports the Coleman Report conclussion only partially: Anglo achievement was not reduced, but black and Mexican-American achievement was not improved due to integration. Determinants other than physical integration--very likely psychological and social integration--have to be considered for this continuing disparity in academic achievement. Plans and future research, based on differential input for attaining equal output, are aimed in this direction in the University of California--school district cooperative teacher education and research programs. When these plans become operative, then a test of consequence of a more sophisticated type of integration on the achievement and adjustment of Anglos, blacks, and Mexican-Americans would be available. (Author/RJ)

Paper prepared for the Annual Convention of the American Educational Research Association, Minneapolis, Minnesota, March 3-6, 1970.

Effect of Integration on Achievement of Anglos, Blacks, and Mexican-Americans[1]

Harry Singer[2]

University of California, Riverside

Integration in Riverside provided a natural-type situation for experimentally testing the following conclusion of the Coleman Report (Coleman, 1966): with the exception of Orientals, achievement of minority pupils, as compared with Anglo pupils, is more affected by the educational background and aspirations of other pupils in the school, and by the quality of the school. To quote the Coleman Report (p. 22) on these two conclusions:

> ...if a white pupil from a home that is strongly and effectively supportive of education is put in a school where most pupils do not come from such homes, his achievement will be little different than if he were in a school composed of others like himself. But if a minority pupil from a home without much educational strength is put with schoolmates with strong educational backgrounds, his achievement is likely to increase.

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and:

> The average white student's achievement seems to be less affected by the strength or weaknesses of his school's facilities, curriculums, and teachers than is the average minority pupil's. ...the inference might then be made that improving the school of a minority pupil may increase his achievement more than would improving the school of a white child increase his.

Mechanisms that could mediate such an effect upon achievement of minority pupils in integrated schools are lateral transmission of peer group values and normalization of instruction (Wilson, 1963). The former mechanism implies that minority pupils in integrated schools, influenced through interactions with classmates from the majority group, would tend to acquire and act upon the values which underlie the achievement of majority pupils. The latter refers to the tendency of teachers to adapt instruction to the average level of the class and to base grading standards upon the average achievement of their particular groups. Since the average achievement of minority pupils from Riverside's three de-facto segregated schools ranked lowest in achievement when compared with the receiving schools, normalization of instruction in integrated classes would tend to challenge and stimulate these minority pupils. Those pupils who were motivated and could benefit from such stimulation would tend to gain in achievement. If any adverse effects upon those minority pupils who could or would not benefit were insufficient to offset the gains, the net result would be enhanced achievement of minority pupils in integrated schools. Since, even after integration in Riverside, majority pupils in the Receiving Schools totaled over 80 percent, the ratio of majority to minority pupils would still be high enough, it would seem, to allow these mechanisms to operate. Hence, if achievement of majority pupils would at least be maintained and statistical convergence in achievement between majority and

minority pupils in Riverside would occur over a three year period, we would have evidence supporting the Coleman Report's conclusions. Further investigation would then be warranted to determine whether such mechanisms as lateral transmission of values and normalization of instruction were, in fact, among the determinants of this convergence.

The purpose of the present report then is to determine whether the above conclusion of the Coleman Report, based upon status measures and geographic sampling to obtain variation in ratio of majority to minority pupils, can be replicated in Riverside's experimental-type situation where achievement measures have been taken over a three year period.

Description of Integration in Riverside

The Riverside Unified School District is a medium sized school system with a total school population of 25,600 and a minority enrollment at the time of integration of 6.1 percent Black, 10.7 percent Mexican-American and 1.7 other minority groups. Integration in Riverside consisted of closing down two of its three completely segregated schools and phasing out the third. Pupils from the segregated schools were then bussed to "receiving schools." The school board's plan called for minority enrollment in each school to approximate the same percentage as was enrolled in the district. With this decision on October 25th, 1965, "de facto segregation had been changed by virtue of board policy into de facto integration" (Singer and Hendrick, 1967, p. 145).

Although this integration policy was justified on the basis of moral, social, educational, and legal reasons, including a broad interpretation of the 1954 Supreme Court mandate (Hendrick, 1968), school district personnel and university professors joined in a cooperative venture to

evaluate the effects of integration on achievement and adjustment of both the ethnic minorities and a control sample of some 900 majority pupils matched with the ethnic minorities on grade, school, and sex. However, the present report focuses only on the achievement aspect of this longitudinal investigation.

Experimental Design

Since this study started with the Coleman hypothesis that integration would have a salutary effect upon achievement of minority pupils without loss in achievement of the majority pupils, the study can be categorized as a time-series experiment, as defined by Campbell (1963). A sample of Anglos, matched with Blacks and Mexican-Americans, was tested prior to integration and then retested yearly for a total of three years.

Samples

The samples are composed of three ethnic groups: Anglos from "Receiving Schools" and Blacks and Mexican-Americans or Chicanos bussed from "Sending Schools." The three Sending Schools are the de-facto segregated schools which had been closed as elementary schools with the onset of integration. The samples are referred to as "Analytic Groups" in order to identify the Sending School and the year in which the samples were integrated.

Since full integration was achieved over a three year period, there are several Analytic Groups.

Analytic Groups

1. A sample of Anglos in the Receiving Schools, matched by grade, sex, and school constitutes Analytic Group 1.
2. Analytic Group 2 consists of pupils desegregated in 1965. Because the primary unit of Lowell Elementary School had burned down in

September 1965, the primary pupils from this school and the kindergarten pupils from another de-facto segregated school, Irving Elementary School, were integrated in the fall of 1965.

3. The intermediate grade pupils from Lowell and all the remaining pupils from Irving were integrated in fall 1966 and are identified as Analytic Group 3.

4. and 7. Casa Blanca, the third de-facto segregated school, located in the Mexican-American barrio in Riverside, was also desegregated over a two-year period: those integrated in 1966 are in Analytic Group 4, and those in 1967 are in Analytic Group 7. The average I.Q.'s of the two groups differed only by two points.

5. and 6. A small group of minority pupils whose residence was outside the attendance area of the three de-facto segregated school was classified as Analytic Group 5. Mentally retarded pupils were placed in Analytic Group 6. Neither Analytic Groups 5 or 6 were included in this study because their sample sizes were too small for statistical analysis.

Test Data

The primary battery was administered in May and the intermediate battery in October, starting in 1966. These are the California state mandated times for administration of Stanford reading achievement tests in grades 1, 2, 3, and 6 and of the Lorge-Thorndike intelligence test for grade 6.

The remaining tests in the achievement battery were locally adopted for district-wide testing. The SCAT and STEP batteries were administered in grades 4 and 5. Also, arithmetic tests were administered throughout

the grades. Thus, data on reading, arithmetic and intellectual performance were collected, but only reading achievement data are used in this report.[1]

Since the initial testing was in spring 1966, Analytic Group 2 was tested after a year of integration, but Analytic Groups 1, 3, and 4 were tested at the beginning of integration, and Analytic Group 7 was tested for two successive years before integration.

Results

The data for part of our longitudinal samples, only those first tested in 1966 in the first and third grades, are shown in Tables 1 and 2 and graphically depicted in Figures 1 and 2.[2] Figure 1 shows the effect

Insert Tables 1 and 2 about here

of integration on the reading achievement of Anglos and Blacks in primary and intermediate grades. The results indicate that after two years of

Insert Figure 1 about here

integration, Blacks at the third grade level are about one year below the reading achievement of the Anglos.

For the intermediate grade longitudinal sample, the gap has widened from 0.5 at grade 3 to 1.4 years at grade 6. Using analysis of covariance and Newman-Keuls' tests of significance of differences, Table 3a and 3b, the

Insert Tables 3a and 3b about here

[1]The effects of integration on arithmetic was the same as on reading achievement.

[2]These samples were selected because they had test data for three years and they covered the primary and intermediate grades.

growth in reading achievement, when adjusted for initial differences at the end of grade 1.9,is significantly greater at the five percent level for Anglos compared with Blacks at the end of the primary grades. But for the intermediate grades, when initial differences at grade level 3.9 are adjusted, the rate of development for Anglos versus Blacks is not significantly different. In other words, there is a significant differential in development for Anglos versus Blacks in the primary, but not in the intermediate grades. However, when the reading achievement of Anglos and Blacks at the end of two years of integration are compared with pre-integration data for these groups, the results are not significantly different. In short, two years of integration had no significant effect upon the reading achievement of Anglos or Blacks.

For Mexican-Americans, compared with Anglos, as shown in Figure 2 and in Table 4a and 4b, the development in reading achievement in the primary

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Insert Figure 2 and Tables 4a and 4b

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grades for Anglos versus Mexican-Americans was significantly different, but only for Analytic Groups 1 (Anglos) and 7 (Casa Blanca) versus 3 (Irving and Lowell pupils desegregated fall 1966). Differences in rate of development in reading achievement between Anglos and three of the remaining four Mexican-American groups in the primary grades were not significantly different at the five percent level. In the intermediate grades, the rate of development in reading achievement of Anglos is significantly greater at the five percent level than for all the Mexican-American groups except for Analytic Group 2, the group which was integrated in 1965, a year earlier than any of the other Mexican-American groups.

In other words, after two years of integration, when initial differences in achievement in reading at the end of the first and the end of the third grade are adjusted, in general, Anglos do not develop more rapidly in reading achievement than Mexican-Americans in the primary grades, but, in general, they do in the intermediate grades. However, when compared with baseline or pre-integration data (Singer, 1967), integration per se, in general, has had no significant effect upon the rates of reading development of Anglos and Mexican-Americans.

Interpretation of Results

Anglos vs. Mexican-Americans

Although integration has had no favorable nor any deleterious effect upon the relative rates of reading development of Anglos versus Mexican-Americans, the data suggest that language development in English as a second language may, in part, play a significant role in the reading achievement of Mexican-Americans. In the primary grades, those pupils who had attended Casa Blanca (Groups 4 and 7) where an intensive language enrichment program had been conducted and pupils from Lowell and Irving (Group 2) who had been desegregated in 1965, a year earlier than other pupils from these schools (Group 3), and hence had more time to adjust to integrated education and also had more exposure to English through peer group interaction did not differ significantly in grades 2 and 3 in rate of reading development from the Anglo group. But, Group 3 (Irving and Lowell), which had one year less integration than Group 2 and did not have a language enrichment program in the primary grades as Casa Blanca had (Groups 4 and 7), was significantly different from Anglos and from Group 7 in its rate of reading development in grades 2 and 3, after adjustment had

been made in the level of reading development of these groups at the end of grade 1.9.

In the intermediate grades, the only Mexican-American group whose rate of reading development was comparable to the Anglos was the group (Group 2) which had experienced one more year of integrated education than the other groups and, like Group 2 in the primary grades, also had an additional year of adjustment to integrated education and to more exposure to English as a second language through peer group interaction. If this hypothesis is tenable, when tested under more carefully controlled conditions, including socio-economic factors and ideally random assignment to treatment groups, then we could conclude that school programs which facilitate the acquisition of English as a second language for bilingual Mexican-American children are likely to have a salutory effect upon their reading achievement. These school programs could include both integration (greater degree of peer group communication in English) and specific training in English as a second language. This hypothesis can be at least partially tested by following the primary grade pupils in this study through their intermediate grade experience. If the hypothesis is tenable,we would anticipate that the rate of reading development of all of the Mexican-American groups would not be significantly different from the Anglo groups in the intermediate grades because the Mexican-American groups would then probably have had sufficient experience in the primary grades in English as a second language to communicate effectively with teachers and their peer group in the intermediate grades, and hence not be handicapped in subsequent learning through the medium of instruction in English.

Anglos vs. Blacks

In the primary grades, the rate of reading development of Blacks in grades 2 and 3 is significantly lower than Anglos, even when adjusted for differences at the end of grade 1.9. Apparently the educational program did not compensate for factors which dif erentiate these two groups. Unlike the data for the Mexican-American groups, the achievement data for the Blacks versus Anglos provides no clue to formulate an hypothesis to explain the discrepancy in the rates of reading development of these two groups in the primary grades.

In the intermediate grades, the rate of development of Anglos versus Blacks is not significantly different when controlled for initial differences in grade 3.9. Again our data provide no clue to explain the comparable rate of development of the two groups in the intermediate grades. Obviously more than physical integration alone is necessary to overcome the mean discrepancy in reading achievement of these two groups. To determine whether these achievement results are attributable to integration, it is necessary to compare them with baseline data.

Comparison of Achievement of Integrated

Analytic Groups with Baseline Data

The baseline for assessing the effects of integrated education on the achievement of the analytic groups was constructed by using the 1966 cross-sectional data for grades one through six. Figures 3a and 3b and Table 5 show these comparisons for Anglos, Blacks, and Mexican-Americans. The achievement

Insert Figure 3a and 3b, and Table 5
about here

of the Anglos clearly has not changed as a consequence of integration. Through the primary grades, the Blacks have dropped slightly: 0.4 and 0.3 grade equivalents in Analytic Groups 2 and 3, respectively. In general, the Mexican-Americans have dropped in reading achievement only in Analytic Group 3 by 0.4 of a grade, while Analytic Groups 2, 4, and 7 have either not dropped or have slightly gained in achievement.

For the intermediate grades, baseline data were not available for Analytic Group 2. At this grade level, for the Blacks, Analytic Group 3 is 0.3 of a grade higher and for the Mexican-Americans, Analytic Groups 2 and 3 are 0.2 and 0.1 of a grade lower, but Analytic Group 7 is exactly equal to the baseline data. These deviations can be attributed to sampling variation. Consequently, it appears that integration has not had any measurable effect upon the reading achievement of these ethnic minorities.

The assumption in a longitudinal analysis is that tests are comparable from grade to grade. To test this assumption, we investigated whether changes in achievement occurred when the same tests were administered in the same grade to pupils who differed in years of integration. Assuming then that our cross-sectional groups of pupils are comparable, we again concluded from our analysis of the resulting data that there were no changes in reading achievement that could be attributed to integration (Singer, 1969).

As a final check on our conclusions, we used analysis of covariance to statistically test growth in achievement over the primary and the intermediate grades for our longitudinal samples. The results of our statistical analysis, shown in Tables 3 and 4, again confirmed our conclusions that integration had no effect upon our Anglo sample or upon our Black and Mexican-American samples.[1]

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[1]These conclusions are consistent with the first part of St. John's (1970, p. 127) conclusion: ..."following desegregation, of whatever type or whatever academic level, subjects generally perform no worse,and in most instances better."

Effect of Level of Receiving School Achievement Upon Reading Improvement of Blacks

Although the overall achievement of Blacks has not improved as a result of integration, it is possible that variation in school environment might still have had a differential effect upon achievement of integrated ethnic groups. To test this hypothesis, a sample of 14 pairs of Blacks, matched in grade one on pre-integration achievement, but contrasted in type of receiving school (upper vs. lower third in rank order of receiving school mean achievement) were compared in grades two and three after one and two years of integrated education. Statistical analysis of the data, Table 6,led to the conclusion that this hypothesis for our samples was not tenable. The smallness of our sample, however, limits the generalizability of our results. But, our results suggest that factors besides quality of school have to be included in the determinants of disparity of achievement among ethnic groups.

Insert Table 6 about here

Effect of Socioeconomic Status Upon Achievement

One of these determinants may be that pupils should already have had the necessary motivational system of values, attitudes, and beliefs as well as background experiences (Katz, 1968) for transforming capabilities into achievement prior to schooling in order to attain maximal benefit from their education. Indeed, in accounting for variation in achievement among ethnic groups, race and social class have been found to interact with interschool differences (Wilson, 1967). We could not test the replicability of this finding in our study because of the smallness of the size of our

samples and because of the truncated nature of the socioeconomic status distributions of our minority groups. An analysis of the socioeconomic distribution of our samples, assessed by the Duncan Parental Occupation Index, had revealed that in our samples, Anglos were significantly above Blacks and Mexican-Americans, and these minority groups did not differ significantly from each other on this scale.

However, disregarding school context, we did find that within our Black groups at the sixth grade level socioeconomic status alone was not significantly related to reading achievement.

Discussion of Results

Although variation among schools may be more salient for Blacks than for Whites (Coleman, 1966) and, more generally speaking, environmental deprivation for each racial and ethnic group interacts with school context (Wilson, 1968), our results may not agree completely with Coleman's conclusion and with Wilson's more general hypothesis for several reasons. One of them may be that the variation in school context factors is more restricted in range in Riverside than in Coleman's and Wilson's samples. Another reason is that if lateral transmission of values which are conducive to improved achievement does occur in the peer group, and if normalization of instruction has its effect upon achievement, these mechanisms might not have had any significant effect upon the achievement of our minority groups, perhaps, because only one or two years of integrated education had occurred. However, it is more likely that these mechanisms could not mediate achievement because physical, more so than psychological and social or educational integration, has occurred in Riverside. When minority pupils for economy reasons are transported to school on a bus, arrive for a nine o'clock reading program, and then depart at two o'clock when half of the primary graders who walked to

school at ten o'clock are just beginning their hour of readi.g instruction, the operation of mediational mechanisms for improving the reading achievement of minority pupils is at least hampered. Furthermore, since reading readiness scores at the end of kindergarten, two years after integration had begun in Riverside, were still significantly different for Anglos vs. Blacks or Mexican-Americans (Purl, 1969), ameliorative steps at the kindergarten level and preschool level must be taken in order to reduce this readiness differential, which appears to be cumulatively amplified through the grades.

Plans for preventing resegregation and for developing a more substantial type of integration — with differential inputs so that the requirements for equality of educational opportunity might be attained (Coleman, 1968) — are now being made in our cooperative University-Riverside School venture.[1] When these plans become operational, then we will have the opportunity to observe the achievement effects of an educational program based on this recently redefined concept of equality of educational opportunity. With a corresponding modification in our concept of integration which would encompass not only physical,but also social and educational components, including differential input, we will be able to make a test of the effects of a more sophisticated type of educational integration on the achievement and adjustment of Anglos, Blacks, and Mexican-Americans.

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[1]Consistent with this purpose, a training program for preparing "Reading Content Specialists for the Junior High School," with Harry Singer as project director, is already in operation, supported with funds from the U.S. Office of Education, Educational Personnel Development Act.

Summary and Conclusions

Integration in Riverside, justified on moral, legal, social, and educational grounds, provided a natural time-series experiment for testing the expected effects of lateral transmission of peer group values and normalization of instruction on the achievement of Anglos (81.5 percent), Blacks (6.1 percent), and Mexican-Americans (10.7 percent). After one to three years of integration for the various groups, the results were analyzed by comparison of 1966-1968 post-integration data with 1966 pre-integration cross-sectional data and with analysis of covariance of the longitudinal data for primary and intermediate grades. Interpretation of these analyses supports the Coleman Report conclusion only partially: Anglo achievement was not reduced, but Blacks and Mexican-Americans achievement was not improved as a consequence of integration.

If the assumption that the distribution of minority and majority group achievement under ideal conditions should be approximately equal and if the trend of the present results is predictive for a longer time period, then determinants other than physical integration have to be postulated to account for the continuing disparity in the academic achievement of majority and minority ethnic groups. Among the determinants are likely to be psychological and social integration. Plans and future research are aimed in this direction in our university-school district cooperative teacher education and research programs. These plans are based on the most recent formulation of equality of educational opportunity in which differential input is necessary for trying to attain the goal of equal output. When these plans become operative, then we can have a test of the consequences of a more sophisticated type of integration on the achievement and adjustment of Anglos, Blacks, and Mexican-Americans.

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Table 1. Effects of Integration on Reading Achievement of Anglos, Blacks and Mexican-Americans

Primary Grades

		Anglos vs. Blacks					Anglos vs. Mexican-Americans				
				Raw Scores					Raw Scores		
Year	Grade	Analytic Group	N	Mean	S.D.	Gr. Eq.	Analytic Group	N	Mean	S.D.	Gr. Eq.
1966	1.9	1. Anglo	139	19.76	9.75	1.7	1. Anglo	139	19.76	9.75	1.7
		2. Black	35	11.69	5.44	1.5	2. Mex.-Am.	25	10.80	5.45	1.5
		3. Black	48	9.23	5.12	1.5	3. Mex.-Am.	29	10.66	3.97	1.5
		4. Black	7	15.86	11.33	1.6	4. Mex.-Am.	23	11.77	7.50	1.5
							7. Mex.-Am.	25	15.80	9.19	1.6
1967	2.9	1. Anglo	114	30.31	13.02	2.8	1. Anglo	114	30.31	13.02	2.8
		2. Black	32	16.78	7.54	1.9	2. Mex.-Am.	25	16.76	9.62	1.9
		3. Black	31	14.23	7.03	1.8	3. Mex.-Am.	23	15.96	6.85	1.9
		4. Black	7	19.86	8.97	2.1	4. Mex.-Am.	16	16.25	8.48	1.9
							7. Mex.-Am.	23	23.00	10.40	2.4
1968	3.9	1. Anglo	98	40.83	12.66	3.4	1. Anglo	98	40.83	12.66	3.4
		2. Black	24	23.92	10.82	2.4	2. Mex.-Am.	23	25.74	10.87	2.5
		3. Black	21	22.76	6.96	2.4	3. Mex.-Am.	16	19.31	9.08	2.1
		4. Black	4	25.25	19.55	2.5	4. Mex.-Am.	12	26.83	8.78	2.6
							7. Mex.-Am.	15	35.73	12.76	3.1
1968	4.2	1. Anglo	104	35.00	13.18	--[a]	1. Anglo	104	35.00	13.18	--[a]
		2. Black	26	24.00	7.50	--	2. Mex.-Am.	25	22.00	7.21	--
		3. Black	19	20.00	7.03	--	3. Mex.-Am.	19	21.00	7.86	--
		4. Black	4	31.00	10.98	--	4. Mex.-Am.	13	27.00	9.12	--
							7. Mex.-Am.	18	27.00	13.01	--

[a]STEP test does not provide grade equivalents.

Table 2. Effects of Integration on Reading Achievement of Anglos, Blacks and Mexican-Americans

Intermediate Grades

		Anglos vs. Blacks					Anglos vs. Mexican-Americans				
		Analytic		Raw Scores			Analytic		Raw Scores		
Year	Grade	Group	N	Mean	S.D.	Gr. Eq.	Group	N	Mean	S.D.	Gr. Eq.
1966	3.9	1. Anglo	92	38.23	13.16	3.2	1. Anglo	92	38.23	13.16	3.2
		2. Black	23	29.57	9.48	2.7	2. Mex.-Am.	17	23.94	11.36	2.4
		3. Black	19	28.63	10.45	2.7	3. Mex.-Am.	24	25.21	11.17	2.5
		4. Black	6	32.17	14.11	2.9	4. Mex.-Am.	17	31.29	10.54	2.9
							7. Mex.-Am.	24	31.50	13.54	2.9
1966	4.2	1. Anglo	73	36.68	14.05	--[a]	1. Anglo	73	36.68	14.05	--[a]
		2. Black	20	25.95	12.94	--	2. Mex.-Am.	13	22.85	12.90	--
		3. Black	16	20.56	13.53	--	3. Mex.-Am.	21	18.33	8.28	--
		4. Black	4	32.75	11.62	--	4. Mex.-Am.	16	28.63	9.16	--
							7. Mex.-Am.	23	30.09	11.82	--
1967	5.2	1. Anglo	80	47.35	13.02	--	1. Anglo	80	47.35	13.02	--
		2. Black	22	32.32	14.16	--	2. Mex.-Am.	13	31.08	14.22	--
		3. Black	14	25.71	10.56	--	3. Mex.-Am.	21	27.95	9.49	--
		4. Black	2	33.50	2.12	--	4. Mex.-Am.	15	33.00	12.51	--
							7. Mex.-Am.	24	39.67	12.28	--
1968	6.2	1. Anglo	59	35.24	12.19	6.1	1. Anglo	58	35.40	12.23	6.1
		2. Black	14	23.57	10.95	4.6	2. Mex.-Am.	13	21.23	7.22	4.3
		3. Black	9	24.11	5.56	4.7	3. Mex.-Am.	19	18.68	6.27	3.9
		4. Black	3	13.67	3.79	3.0	4. Mex.-Am.	13	20.08	9.86	4.2
							7. Mex.-Am.	23	23.52	10.00	4.6

[a]STEP Test does not provide grade equivalents.

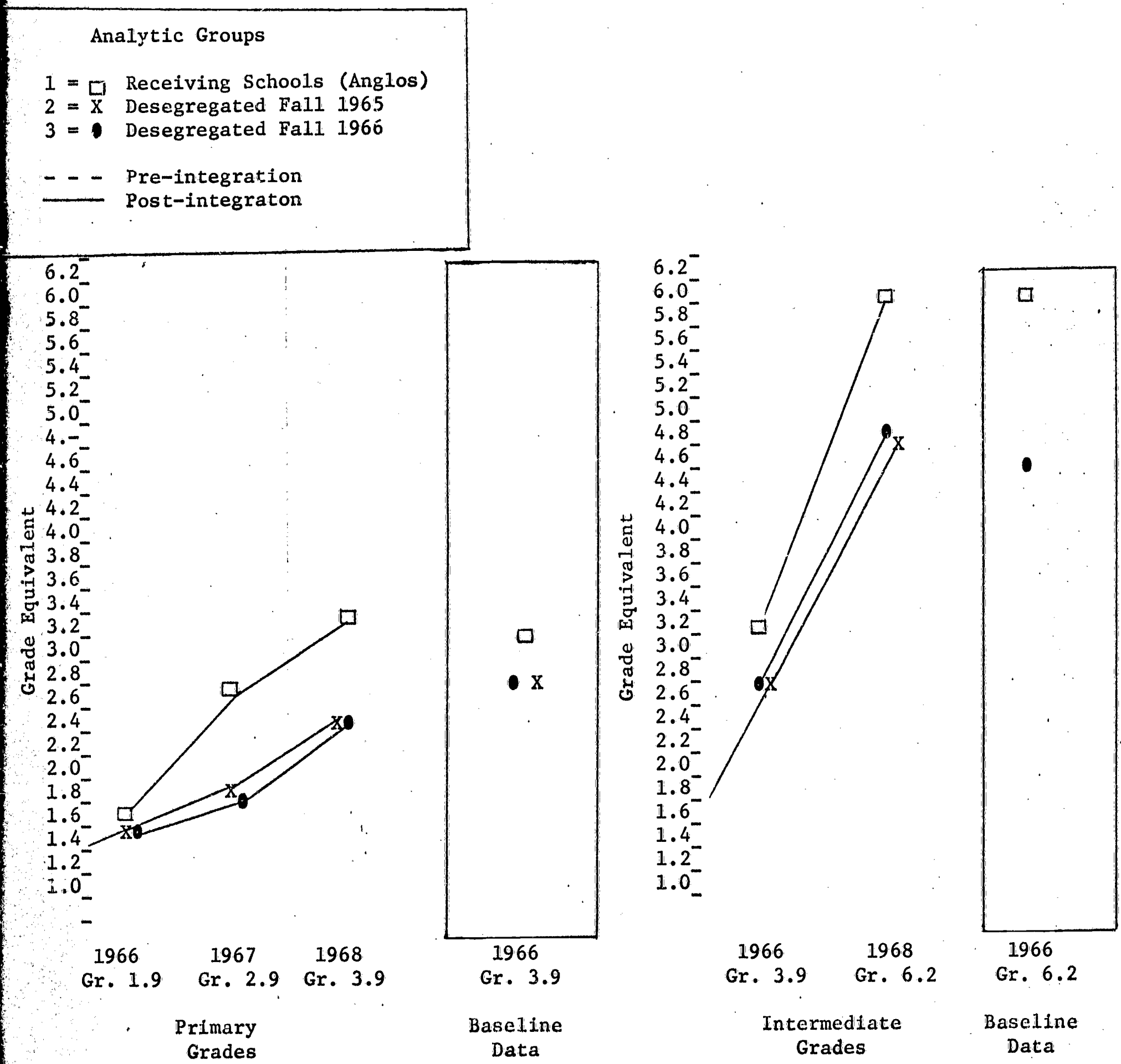


Figure 1. Effects of Integration on Reading Achievement of Anglos and Blacks in Primary and Intermediate Grades. Pre-integration or Baseline Data for Primary Grade groups and for Intermediate Grade groups are shown on the right hand side of each graph.

Table 3a. Analysis of Covariance Results of Reading Achievement in Grade 3.9, Controlling on Reading Achievement in Grade 1.9, for Longitudinal Samples of Anglos vs. Blacks.

Source	SS	df	MS	F	p
Treatments	1683.65	2	841.82		
Experimental Error	12702.02	139	91.38		
Total	14385.67	141		F = 9.21	$p \leq .05$

A Posteriori Comparison

Newman-Keuls[a]

Analytic Group	1	2	3
Sample Size	101	24	18
Adjusted mean reading scores	38	30	29

[a]Group 1 is significantly different ($p \leq .05$) from Groups 2 and 3.

Table 3b. Analysis of Covariance Results of Reading Achievement in Grade 6.2, Controlling on Reading Achievement in Grade 3.9, for Longitudinal Samples of Anglos vs. Blacks.

Source	SS	df	MS	F	p
Treatments	21.85	2	10.92		
Experimental Error	3965.79	67	59.19		
Total	3987.64	69		F = 0.18	$p \leq .05$

A Posteriori Comparison

Newman-Keuls[a]

Analytic Group	1	2	3
Sample Size	51	11	9
Adjusted mean reading scores	33	32	32

[a]No significant differences were found for any of the Comparisons. ($p > .05$)

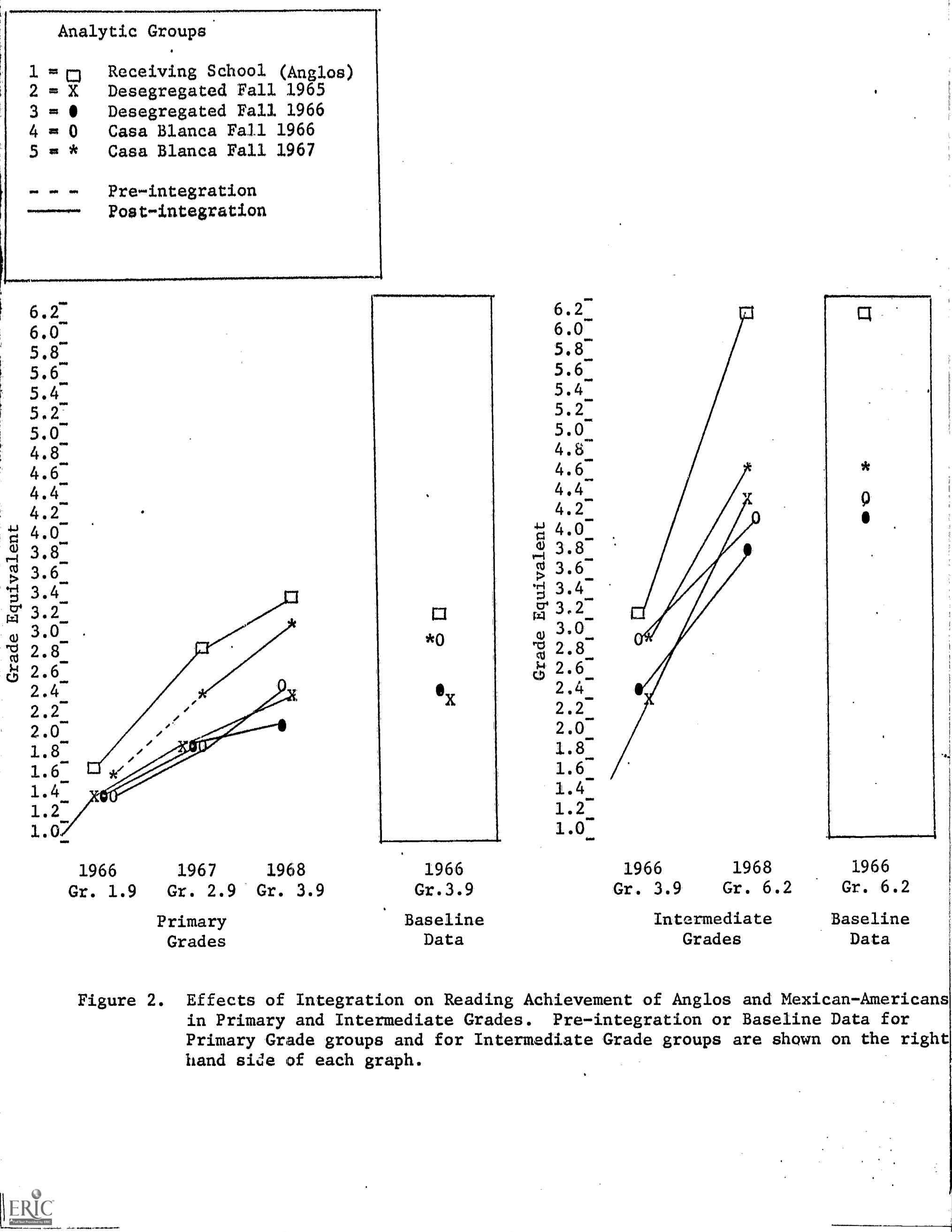


Figure 2. Effects of Integration on Reading Achievement of Anglos and Mexican-Americans in Primary and Intermediate Grades. Pre-integration or Baseline Data for Primary Grade groups and for Intermediate Grade groups are shown on the right hand side of each graph.

Table 4a. Analysis of Covariance Results of Reading Achievement in Grade 3.9, controlling on Reading Achievement in Grade 1.9 for Longitudinal Samples of Anglos vs. Mexican Americans.

Source	SS	df	MS	F	p
Treatments	2205.89	4	551.47		
Experimental Error	14893.01	159	93.66		
Total	17098.90	163		F = 5.88	$p \leq .05$

A Posteriori Comparison

Newman-Keuls[a]

Analytic Group	1	2	3	4	7
Sample Size	101	18	17	12	17
Adjusted mean reading scores	38	31	25	32	36

[a]Only Groups 1 vs. 3 and 7 vs. 3 are significantly different ($p \leq .05$) from each other.

Table 4b. Analysis of Covariance Results of Reading Achievement in Grade 6.2, Controlling on Reading Achievement in Grade 3.9, for Longitudinal Samples of Anglos vs. Mexican-Americans

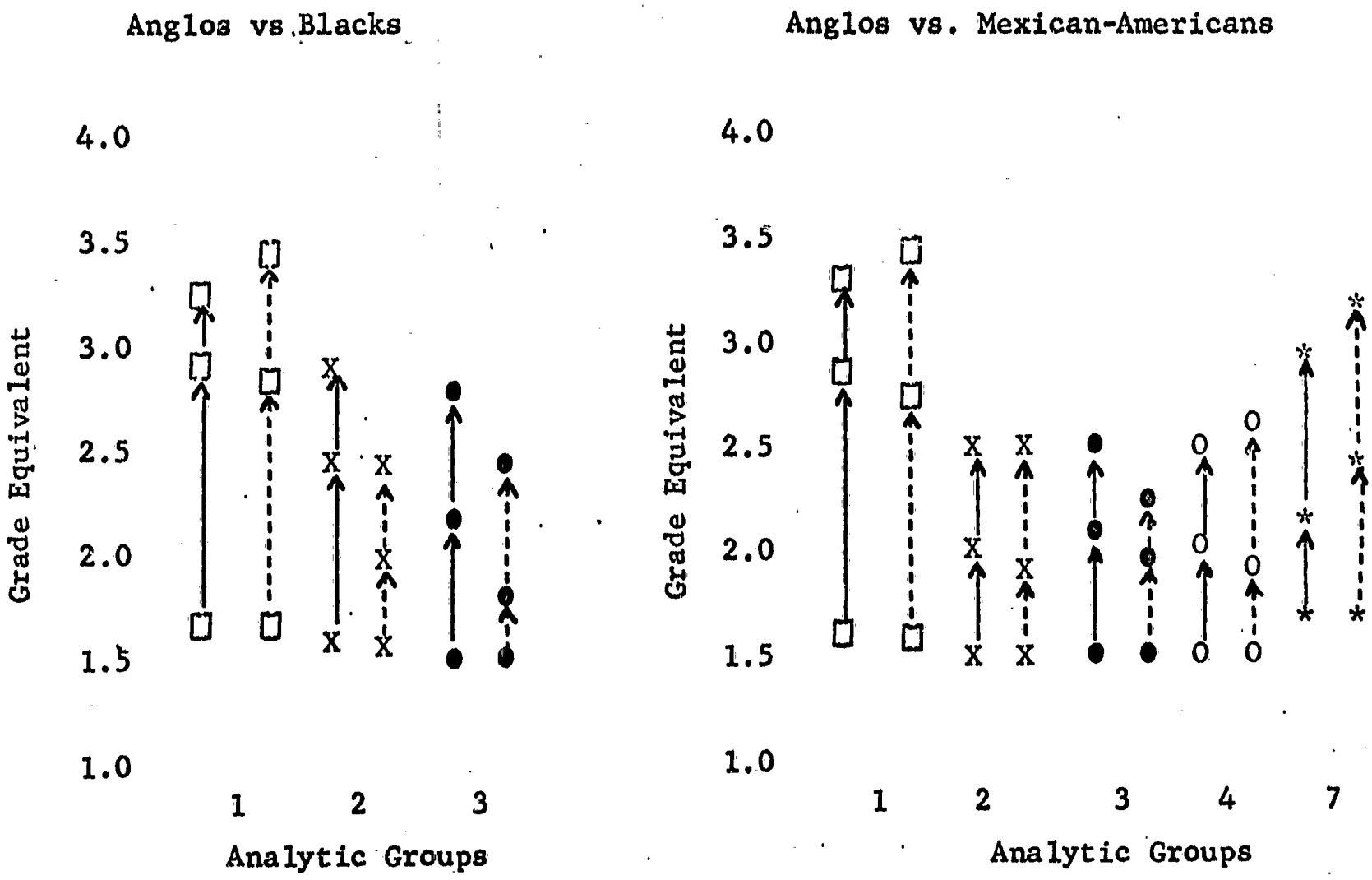
Source	SS	df	MS	F	p
Treatments	1264.71	4	316.17		
Experimental Error	5392.80	108	49.93		
Total	6657.52	112		F = 6.33	$p \leq .05$

A Posteriori Comparison

Newman-Keuls[a]

Analytic Groups	1	2	3	4	7
Sample Size	51	13	17	13	20
Adjusted mean reading scores	32	29	23	24	25

[a]Significant differences ($p \leq .05$) were found for Groups 1 vs. 4, 1 vs. 3, 1 vs. 7, and 2 vs. 3.



___ = 1966 Cross-Sectional Data

--- = 1967-68 Longitudinal Data

Analytic Groups
1 = □ Receiving School
2 = X Desegregation Fall 1965
3 = ● Desegregation Fall 1966
4 = O Casa Blanca School 1966
7 = * Casa Blanca School 1967

Figure 3a. Comparison of Integrated Analytic Groups with 1966 Cross-Sectional Baseline Data for Grades 1.9 to 3.9.

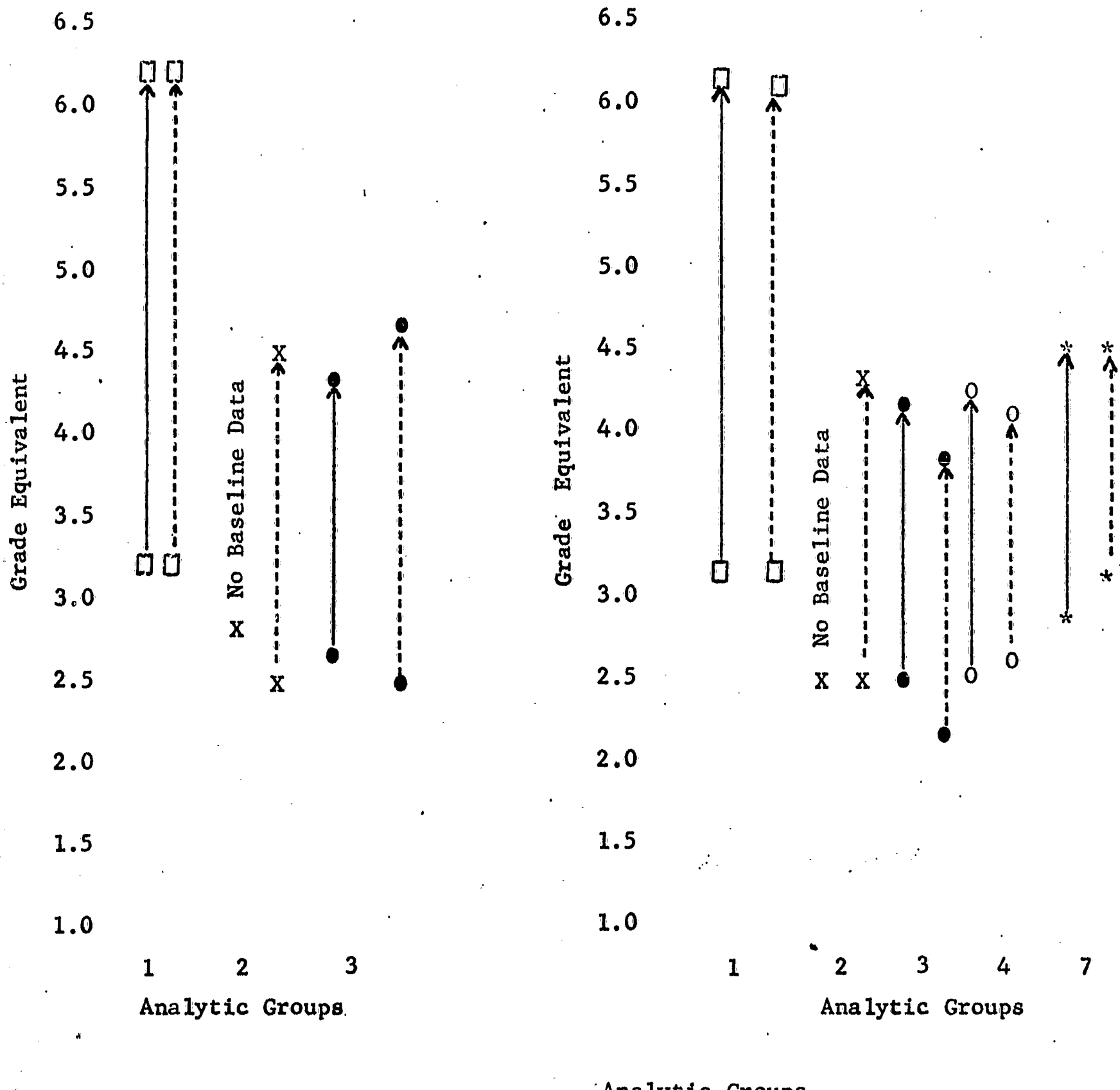


Figure 3b. Comparison of Integrated Analytic Groups with 1966 Cross-Sectional Baseline Data for Grades 3.9 to 6.2.

Table 5. Comparison of Mean Reading Achievement of Integrated Analytic Groups with Baseline Data.

Analytic Groups	Sample Size	Third Grade 1966 Raw Score	Third Grade 1966 Grade Equiv.	Sample Size	Third Grade 1968 Raw Score	Third Grade 1968 Grade Equiv.	t	p*	Sample Size	Sixth Grade 1966 Raw Score	Sixth Grade 1966 Grade Equiv.	Sample Size	Sixth Grade 1968 Raw Score	Sixth Grade 1968 Grade Equiv.	t	p*
1. Anglo	92	38.23	3.2	98	40.83	3.5	-1.43		59	35.49	6.1	59	35.24	6.1	0.11	
2. Black	23	29.57	2.8	24	23.92	2.5	-1.91		NO PRE-INTEGRATION DATA							
3. Black	19	28.63	2.7	21	22.76	2.4	2.08		20	22.40	4.4	9	24.11	4.7	-0.57	
1. Anglo	92	38.23	3.2	98	40.83	3.5	-1.43		59	35.49	6.1	59	35.24	6.1	0.11	
2. Mex.-Am.	17	23.94	2.5	23	25.74	2.6	-0.51		NO PRE-INTEGRATION DATA							
3. Mex.-Am.	24	25.21	2.5	16	19.31	2.1	1.77		40	19.22	4.1	19	18.68	4.1	0.28	
4. Mex.-Am.	17	31.29	2.9	12	26.83	2.7	1.20		23	20.08	4.2	16	20.75	4.3	-0.22	
7. Mex.-Am.	24	31.50	2.9	15	35.73	3.1	-0.98		14	23.20	4.6	23	25.52	4.9	-0.60	

*Differences were not significant at the .05 level for any of the groups compared.

Table 6. Effects of Type of School Upon Achievement of Matched Groups of Blacks Over Two Years of Integrated Education

	High Achieving School		Low Achieving School		
	N	Mean	N	Mean	t
Pre-integration Matching					
Grade 1, 1966	14	13.21	14	12.43	*
Post-integration Test Results					
Grade 2, 1967	14	16.79	14	16.86	*
Grade 3, 1968	14	23.00	14	26.57	*

*Differences between the means were not significant at the five percent level.